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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/574,804	04/05/2006	Yuji Yasui	108419-00082	2064
4372	7590	12/01/2008	EXAMINER	
ARENT FOX LLP 1050 CONNECTICUT AVENUE, N.W. SUITE 400 WASHINGTON, DC 20036			RIDDLE, KYLE M	
			ART UNIT	PAPER NUMBER
			3748	
			NOTIFICATION DATE	DELIVERY MODE
			12/01/2008	ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

DCIPDocket@arentfox.com  
IPMatters@arentfox.com  
Patent\_Mail@arentfox.com

## Office Action Summary

**Application No.**

10/574,804

**Applicant(s)**

YASUI ET AL.

**Examiner**

KYLE M. RIDDLE

**Art Unit**

3748

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 21 July 2008.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-12 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☒ Claim(s) 4-12 is/are allowed.  
6) ☒ Claim(s) 1-3 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 05 April 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO/5508)  
Paper No(s)/Mail Date 5/13/08  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_  
5) ☐ Notice of Inventor's Patent Application  
6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Response to Amendment***

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu et al. (U.S. Patent 6,722,325) in view of Yasui (U.S. Patent 7,124,013).

Shimizu et al. disclose a variable valve control apparatus comprising:

- an intake air amount control system with an engine control unit 114 receiving detection signals from an air flow meter 115, an accelerator pedal sensor APS 116, and a crank angle position sensor 117 (column 2, lines 52-58);

- a variable valve lift mechanism 112 (column 3, lines 5-17);

- a variable valve timing mechanism 113 (column 5, lines 3-13);

- a target volume flow means based on engine load (column 6, lines 37-47);

- a first control value calculating means or target valve lift amount of lift mechanism 112 is calculated and feedback controlled based on target volume flow (column 6, lines 58-67 with column 7, lines 1-8);

- a second control means for controlling a target valve opening timing based on target volume flow and engine load (column 7, lines 25-35);

- the control means controlling the amount of valve lift or the valve overlap to obtain the desired target volume flow (column 7, lines 53-59; claims 1-3).

They, however, fail to specifically disclose feedback control to converge the detected intake air amount to the target intake air amount.

Yasui teaches a control method which calculates a target air-fuel ratio and using feedback control to converge to a specific target amount (column 1, lines 29-42, column 31, lines 10-22). It would have been obvious to one having ordinary skill in the art at the time of the invention was made, to have utilized the teaching by Yasui in the variable valve timing apparatus of Shimizu et al., since the use thereof would have provided a specific control mechanism for each calculating means providing for the convergence to a target intake air quantity and more efficient engine operation.

3. Claim 2 is rejected under 35 U.S.C. 103(a) as being obvious over Shimizu et al. in view of Yasui.

Shimizu et al., as modified by Yasui, disclose the variable valve control apparatus cited above, however, fail to specifically disclose a feedback control system based on two degree of freedom control algorithm.

The use of a two degree of freedom control algorithm is well known in the art (for example, see IDS references JP-2003-65135 and JP-2003-21001) depending on the level of desired controllability, complexity, etc., and is therefore obvious to one of ordinary skill in the art.

4. Claims 3/1 and 3/2/1 are rejected under 35 U.S.C. 103(a) as being obvious over Shimizu et al. in view of Yasui.

Shimizu et al., as modified by Yasui, disclose the variable valve control apparatus cited above, however, fail to specifically disclose a calculating interval of the control value calculating means being longer than a calculation interval of the control input calculating means.

Yasui teaches an engine control mechanism where the calculation period for a first value calculating means and a second value calculating means is set to be longer than a calculation period of a control input calculating means (see claims). It would have been obvious to one having ordinary skill in the art at the time of the invention was made, to have utilized the teaching by Yasui in the variable valve timing apparatus of Shimizu et al., since the use thereof would have provided a specific control mechanism allowing the control inputs to be calculated quicker than the control means facilitating better control of the variable valve lift and timing mechanisms.

***Allowable Subject Matter***

5. Claims 4-12 are allowed.

***Response to Arguments***

6. Applicant's arguments with respect to claims 1-3 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

7. The IDS (PTO-1449) filed on 13 May 2008 has been considered. An initialized copy is attached hereto.

*Communication*

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to KYLE M. RIDDLE whose telephone number is (571)272-4864. The examiner can normally be reached on M-F (07:30-5:00) Second Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Denion can be reached on (571) 272-4859. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Thomas E. Denion/  
Supervisory Patent Examiner, Art Unit 3748

/Kyle M. Riddle/  
Examiner  
Art Unit 3748

kmr